Name of Assignment: **Problem Solving/Data Analysis Unit Plan**

**Date Due**: **December 7**

Faculty to be contacted for specific questions: Mark Roddy

**Objectives:**

**1. Planning and content knowledge**

* Plans focused and sequenced instruction aligned with curriculum standards and outcomes;
* Uses knowledge of students’ personal, socio-cultural, and linguistic characteristics to inform instruction;
* Uses knowledge of students’ families and communities to inform instruction.

**2. Assessing learning**

* Plans assessments to monitor and support student learning;
* Analyzes student work related to standards and learning targets;
* Uses a variety of assessments to inform instruction;
* Provides students with feedback to guide further learning.

3**. Applying culturally and linguistically responsive instruction**

* Uses knowledge of students’ lives to inform instruction;
* Creates and nurtures with students a classroom culture of inclusion and advocacy;
* Applies appropriate and varied instructional strategies;
* Monitors students’ progress and differentiates instruction accordingly;
* Understands language demands and differentiates instruction accordingly;
* Collaborates with families and communities to facilitate student achievement.

**4. Demonstrating a commitment to the ethical and professional dimensions of teaching**

* Identifies and implements tenets of justice and diversity that are culturally responsive to facilitate student achievement;
* Understands and appreciates the importance of actualizing goals of multicultural education and the benefits of a just and diverse world;
* Demonstrates collaborative, professional growth-centered practices;
* Demonstrates practices that are informed by a values position reflecting understanding of the political, ethical and moral complexities of schooling;
* Prepares students to be responsible citizens for an environmentally sustainable, globally interconnected, and diverse democratic society.

**Rationale for the assignment:**

Research in mathematics and science education points out the importance of allowing students to encounter substantial problems that provide a setting for the construction of conceptual understanding, the development of procedural fluency and the use of increasingly sophisticated reasoning and problem solving skills. It is important that students experience the processes of problem formulation or clarification, data gathering, analysis, synthesis, solution and communication of results. Classroom-level assessment is an integral part of the learning process informing teacher decision making and providing feedback to students and parents as well as teachers. Teachers must consciously orchestrate opportunities for students to engage in constructive, focused scientific and/or mathematical discourse based on sound use of academic language that is central to the discipline. All these things rely on teachers’ knowing their students well, their prior academic achievements and struggles, and the strengths they bring from their communities and family histories.

***NOTE: You must earn a grade of B (3.0) or higher on each unit plan in order to successfully complete TEED 521 and to continue in the program.***

***Please note also that because of the timing of this unit in the course of the quarter, it is not possible to revise and re-submit this unit.***

Here are the tasks you will need to complete, with references to their placement in the rubric that follows.

**1. Content**

1.1 Consider the classes you teach and within one class select a single topic(or closely related set of topics) as the central focus for this unit plan (e.g., dividing common fractions).

1.2 Give a rationale for your selection of this topic. Why is it important for students to learn? Consider and describe the relevant ethical issues that are important in teaching this unit.

1.3 Describe what students will know and be able to do if they are successful with this topic.

1.4 From this description develop two to five unit-level learning targets. (Targets must be classified as facts, concepts, skills, or dispositions). For each unit-level learning target, as appropriate, cite one state standard that is most closely related.

1.5 Discuss the ways in which these learning targets may be associated with the development of conceptual understanding, procedural fluency, reasoning and problem solving skills.

3.1 Develop a summative assessment instrument(s) that will give you information about students’ levels of achievement with regard to each of your unit-level learning targets.

1.6 Develop an Essential Question (e.g., “How do we divide fractions and why should I care?”).

**2. Learners**

2.1 With your central focus (1.1) and your Essential Question (1.6) in mind, consider your students and their lives. Describe the community, the school, the students’ families, and finally the students themselves. Describe the students in terms of

1. Academic development (2.1a);
2. Academic language development (2.1b);
3. Social and emotional development (2.1c);
4. Family / community / cultural assets (2.1d).
5. Dispositions related to the central focus (2.1e)

2.2 Describe the ways in which the characteristics described above (2.1 a - e) influence your decisions about instructional strategies and learning tasks.

2.3 In view of what you know about your learners, the school and the community, create a Web page that introduces the unit to your students’ families. Be sure to describe the highlights of the unit as well as some ways in which families can support learning at home. Be prepared to supply hard copies to families without Web access. Insert that hardcopy in your unit plan along with a URL for the Web site if it is “published.”

**3. Instruction**

Write three to seven lesson plans that will facilitate student learning and attainment of the unit level learning targets. (If more than seven lessons will be needed to address the topic, additional lessons may be described in summary fashion.) Each lesson plan must include:

* Title and expected duration of the lesson (How long will it take?) (3.1i)
* One to four lesson-level learning targets for both content and academic language as needed. (Cite related unit-level learning targets and state or Common Core standards.) (3.1ii)

Evidence of achievement, stated in terms of student behaviors, for each learning target. (3.1iii)

* Assessment(s), either formal or informal, formative or summative. At least 1 rubric-based assessment and one student self-assessment must be developed (or adapted) and included. You must have one summative assessment that provides information about student achievement with respect to all of your unit-level learning targets. Include scoring guides appropriate for all assessment(s). (3.2)
* Narrative descriptions of each lesson (use of ed tech included as appropriate). (3.3i)
* Resources and materials needed to complete the lesson. (3.3ii)
* Identify relevant co-teaching strategies. (3.3iii)

**4. Analysis and Reflection**

Explain how the elements of the lessons you have developed are sequenced so as to enable the students in your class to achieve your learning targets. Indicate how specific research and theory has informed your decisions. (4.1)

Identify oral and written language demands inherent in the learning tasks and explain how the tasks help students meet these demands. (4.2)

Describe ways in which your instructional plans address special needs and abilities within your class. (4.3)

**5. Formatting the unit plan**

On the title page identify unit title, school, grade level, the date, and your name and e-mail address. (5.1)

Number all pages. (5.2)

Attend to editing to ensure a well-written unit plan. (5.3)

At the end of your unit please include an annotated bibliography of resources you consulted in APA format. (5.4)

If unit was done in collaboration with a peer(s), describe how you worked together. (5.5)

Note: You will upload your unit plan to TaskStream and submit a hard copy on the due date to Mark Roddy

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**Rubric for the evaluation of the Problem Solving / Data Analysis Unit**

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| * 5 **Exceptional Evidence** * In addition to clear and convincing evidence: * Demonstrates sophisticated levels of integration of theory and practice in lesson planning. | * 4 **Clear and Convincing Evidence** * Addresses all criteria & requirements completely; * Demonstrates thorough understanding and application in the use of elements and in lesson planning. | * 3 **Generally Clear and Convincing Evidence** * Address all criteria; most addressed completely; * Occasionally misses minor applications and/or understanding the use of elements and in lesson planning. | * 2 **Uneven Evidence** * Addresses criteria or requirements in a minimal fashion; * Demonstrated understanding and/or application is uneven. | * 1 **Unacceptable/** * **Insufficient Evidence (N/C)** * Omits key information or requirements; * Fails to address key criteria; * Too general or misapplies theory to practice; * Superficial completion of task. |
| 1. **Effective teachers know their content**, demonstrating their grasp of and the nature and structure of the discipline as well as their understanding of state standards in the relevant content areas. | | | | |
| **Content Considerations**  1.1 Consider the subjects you teach and select a topic (a.k.a. “central focus”) within a subject (e.g., dividing common fractions).  1.2 Give a rationale for your selection of this topic. Be sure to answer this question: How will this unit enable your students to use mathematics and / or science to be better able to make sense of the world? Describe any ethical issues or considerations that are important in teaching this unit.  • Demonstrates an understanding of the purpose of enabling students to understand math/science;  • Makes connections to ethical dimensions of subject and/or teaching issues.  1.3 Briefly describe what students will know and be able to do if they are successful with this topic.  • Succinct, focused description of observable behaviors, indicating understandings, abilities and inclinations.  1.4 From the description in 1.3 develop two to five unit-level learning targets. (Targets must be classified as facts, concepts, skills, or dispositions). For each unit-level learning target, as appropriate, cite one standard (Washington state, Common Core, etc. as appropriate in your school) that is most closely related.  1.5 Make clear connections between what you are asking students to do in service of the unit-level learning targets and their development of conceptual understanding, procedural fluency, mathematical reasoning or problem solving skills.  1.6 Develop an Essential Question (e.g., “How do we divide fractions and why should I care?”).  • Essential Question encapsulates the central content of the unit and is phrased so as to appeal to students.  5 | 4 | 3 | 2 | 1  | | | | | | | | | |
| 2. **Effective teachers know their learners well**. They understand their students’ social and emotional development, academic development, and family, community, and cultural assets. They are able to facilitate personal connections to the learning. They encourage and facilitate family involvement in the learning processes of their students. | | | | |
| **Classroom Context for Learning**  **2.1** Using the information from your Context for Learning, describe the students in your class in terms of:  a. Academic development;  b. Academic language development;  c. Social and emotional development;  d. Family / community / cultural assets.  e. Dispositions related to the unit’s central focus (i.e., do they see math / science as sensible, useful and worth while? Do they persevere in problem solving efforts? Do they believe in their own ability in math / science?  • descriptions have been modified as necessary to reflect the situation in this content area and with regard to this topic.  2.2 With your Essential Question (see 1.6 above) in mind, give a brief description of the ways in which the characteristics described above influence your decisions about the instructional strategies, learning tasks, and assessments you will use in this unit.  • Clear and specific connections are made between learner characteristics and instructional decisions.  5 | 4 | 3 | 2 | 1  | | | |  **Family Involvement**  2.3 In view of what you know about your learners, the school and the community, create a Web (or wiki) page that introduces the unit to your students’ families. As part of the Web page be sure to a.) describe the highlights of the unit, b.) describe at least one family-involvement activity that could be done at home and that would address the aims of the unit generally, and c.) invite two-way communication between home and classroom. Include both the URL (if you “publish” this on the Web) and a hard copy of the Web page.  • Web page creates a positive tone;  • Fosters understanding of the unit’s learning targets, its purpose and a general timeline;  • Provides an activity that the student can do at home with family members;  • Invites and facilitates two-way communication between home and classroom;  • There are no writing errors.  5 | 4 | 3 | 2 | 1  | | | | | | | | |
| 3. **Effective teachers plan for instruction**. Their plans include evidence of achievement related to their learning targets and appropriate assessments and learning tasks. Their instructional tasks are adapted to meet the needs of their learners. They are able to sequence lessons and apply relevant research and/or learning theory to their planning. | | | | |
| Write three to seven lesson plans that will facilitate student learning and attainment of the unit level learning targets. (If more than seven lessons will be needed to address the topic, additional lessons may be described in summary fashion.)  Each lesson plan must include elements 3.1 – 3.3:  **Learning Targets & Evidence**  3.1 i) Title and expected duration for the lesson (duration = how long will it take?);  3.1 ii) One to four lesson-level learning targets addressing both content and academic language as needed. (Cite related unit-level learning targets (1.4) and Washington state or Common Core standards as appropriate.)  • Targets are focused, central, related to standards as appropriate.  3.1 iii) Evidence of achievement, stated in terms of student behaviors, for each learning target.  • Statements of evidence are clearly matched to specific targets, describing behaviors and student characteristics indicative of achievement of the target.  5 | 4 | 3 | 2 | 1  | | | |  **Assessments**  3.2 Create/adapt/select assessment instruments to address selected learning targets or combinations of learning targets. You must have a minimum of one assessment per lesson. Assessments may be formal or informal, formative or summative. Be sure to identify the learning targets addressed by each assessment you provide. Be sure that somewhere in your assessments you have created at least one rubric-based assessment, and one student self-assessment. You must also create and clearly designate one assessment instrument as your summative assessment for the unit. This instrument should provide information about student achievement with respect to all of your unit-level learning targets. Your assessment instruments may include tests or quizzes, projects, performance assessments, exit tickets, etc. For each assessment include a scoring guide. These may be rubrics, checklists, rating scales, answer keys, etc.  Assessment instruments are:  • Focused and specific to evidence of learning;  • Aligned with learning target(s);  • Substantive in distinguishing differences from one level of achievement to another; and  • Developmentally appropriate.  5 | 4 | 3 | 2 | 1  | | | |  **Instructional Tasks (**and Appropriate Use of Technology**)**  3.3 i) Provide a brief but clear narrative description of each lesson. (Be sure to describe the use of any relevant educational technology);  • Clear and focused description of the lesson’s elements are provided;  • Lessons and elements within lessons are logically sequenced;  • Lessons and elements within lessons are developmentally appropriate;  • Lessons address the learning targets;  • Pacing demonstrates an understanding of students’ learning needs.  3.3 ii) Provide a list of resources and materials needed to complete the lesson;  3.3 iii) Identify relevant co-teaching strategies for each lesson.  5 | 4 | 3 | 2 | 1  | | | | | | | | |
| **4. Effective teachers analyze and reflect.** They are able to explain the ways in which the elements of their lessons and assessments are devised and sequenced so as to provide experiences and feedback to students at all levels of achievement and with a wide variety of needs and abilities. | | | | |
| **Connections to Theory & Research**  4.1 Discuss and cite the theory and research that has informed your plan. Explain how this sequence of instructional tasks addresses selected key learning principles (e.g., active engagement, conceptual understanding, procedural fluency, problem solving, mathematical reasoning, discourse, etc. ) in order to ensure that *all* students will have the opportunity to learn. (Locate relevant sources by reviewing Burns and other texts/documents used in the math/science strand in TEED 521.)  • Connections between theory/research and unit plan/lesson plans are explicit;  • Connections demonstrate understanding of theory and research as it applies to mathematics/science; and  • Specific citations are included that relate to specific elements of this unit.  5 | 4 | 3 | 2 | 1  | | | |  **Academic Language**  4.2 Identify oral and written language demands inherent in the learning tasks and explain how the tasks help students meet these demands. Be sure to identify key language functions, vocabulary, syntax and elements of discourse.  5 | 4 | 3 | 2 | 1  | | | |  **Special Needs**  4.3 Describe ways in which your instructional plans address special needs and abilities (e.g., students with IEPs, English language learners, struggling readers, underperforming students or those with gaps in academic knowledge, and/or gifted students) within your class.  • Description demonstrates understanding of learning needs of students.  5 | 4 | 3 | 2 | 1  | | | | | | | | |
| **5. Effective teachers take care of the mundane stuff too.** | | | | |
| **Editing, Conventions and Report Structure**  5.1 On the title page identify unit title, school, grade level, date, and your name and e-mail address.  5.2 Number all pages.  5.3 Attend to editing to ensure a well-written, grammatically correct unit plan.  5.4 At the end of your unit please include an annotated bibliography (APA format) of resources you consulted.  • Accurate APA format.  Annotations:  • Original (not copied from another source); and  • Provide brief summary of each resource.  5.5 If unit was done in collaboration with a peer(s), describe how you worked together.  5 | 4 | 3 | 2 | 1  | | | | | | | | |

Note: The narrative outlines you provide in task 3.3 should demonstrate your grasp of the following pedagogical issues (These pertain to the students’ opportunities to learn):

Deep knowledge and understanding: The knowledge and understanding of the concepts and generalizations are focused and reflect the central ideas to the topic/theme of the unit. Learners are able to understand the relationships between and among the concepts and skills as the unit develops.

Problematic knowledge: Learning opportunities are presented through problems to be solved. Students are encouraged to address multiple perspectives and or solutions.

Higher order thinking: Students are regularly engaged in thinking that requires them to organize, reorganize, apply, analyze, synthesize, and evaluate knowledge and information.

Substantive communication: Students have many opportunities to engage in sustained conversations that deepen their understanding of the unit’s central question and learning targets.

Metalanguage: Lessons explicitly guide students to reflect on their own thinking and learning.

Effective use of technology: Students and teachers make wise use of technology as a means to enhance learning when it is appropriate to do so.